

3

nication channels and the transmission power on each channel is controlled on the basis of a transmission power instruction signal transmitted from each of said plurality of mobile terminals, comprising:

- a plurality of base station side transceivers, one provided for each of said channels, each receiving signals from a corresponding mobile terminal, separating said transmission power instruction signal from receive signals, amplifying the signals to be transmitted to the mobile terminal of the corresponding channel at a level of transmission power designated by the transmission power control signal, and transmitting these signals to the corresponding mobile terminal, and
- a transmission power control unit which is supplied with transmission power instruction signals separated by said plurality of base station side transceivers, provisionally determines the transmission power levels of said plurality of transceivers on the basis of these transmission power instruction signals, corrects the provisionally determined transmission power levels according to the sum of the provisionally determined transmission power levels, and supplies values indicating the corrected transmission power levels to said plurality of base station side transceivers as said transmission power control signals.

According to another aspect of the invention, there is provided a mobile communication system in which a base station and a plurality of mobile terminals communicate with each other over preset communication channels, wherein:

- each of said plurality of mobile terminals is provided with:
- a receiving condition detector for assessing the quality of receive signals received from said base station over a channel set for that mobile terminal, and generating a transmission power instruction signal for requesting said base station to change its transmission power according to the assessed quality, and
- a mobile terminal side transceiver for receiving signals from said base station, and transmitting data to be transmitted to said base station and said transmission power instruction signal to said base station; and
- said base station is provided with:
- a plurality of base station side receivers, one provided for each of said channels, for receiving signals from a corresponding mobile terminal, separating said transmission power instruction signal from receive signals, amplifying the signals to be transmitted to the mobile terminal of the corresponding channel at a level of transmission power designated by the transmission power control signal, and transmitting these signals to the corresponding mobile terminal, and
- a transmission power control unit which is supplied with transmission power instruction signals separated by said plurality of base station side transceivers, provisionally determines the transmission power levels of said plurality of transceivers on the basis of these transmission power instruction signals, corrects the provisionally determined transmission power levels according to the sum of the provisionally determined transmission power levels, and supplies values indicating the corrected transmission power levels to said plurality of base station side transceivers as said transmission power control signals.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram for describing a mobile communication system according to the prior art,

4

FIG. 2 is a block diagram for describing the principle of the present invention

FIG. 3 is a block diagram illustrating the configuration of a base station according to the invention; and

FIG. 4 is flow chart for describing the operation of the transmission power control unit 14 of FIG. 3.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 2 is a block diagram for describing the principle of the present invention. As comparison of FIGS. 1 and 2 would clearly reveal, a difference between the invention and the prior art consists in that a single transmission power control unit 14 replaces the transmission power control units 31, 32 and 33, each provided for one or another of the transceivers 11, 12 and 13 according to the prior art, and this transmission power control unit 14 can collectively control transmission power levels on all the channels. Other differences between the invention and the prior art will become evident with the progress of description.

First will be described operations related to the transceiver 11 for channel 1. Upon receiving signals via the antenna 15 from a mobile station to which channel 1 is assigned, the transceiver 11 for channel 1 demodulates the receive signals, separates them into signals R1 indicating speech, data or the like and a transmission power instruction signal C1, and delivers the latter to the transmission power control unit (PCONT) 14. This transmission power instruction signal C1 includes instruction information from the mobile station regarding how much the base station should raise or lower its transmission power level.

First, the transmission power control unit 14 provisionally determines in accordance with the transmission power instruction signal C1 at what transmission power level transmission to the transceiver 11 for channel 1 should be set. However, if this provisionally determined level is above the upper limit, or below the lower limit, of a preset transmission power range, it provisionally chooses the upper or lower limit, whichever applies, as transmission power control signal P1. The procedure up to this point is the same for channels 2 through N, too.

Next, if the sum of the provisionally determined transmission power levels of every channels surpasses a prescribed level, the transmission power control unit 14 will correct the provisionally determined power levels. For instance, it will reduce the transmission power levels on channels 1 through N evenly or the transmission output on each channel according to its provisionally determined level. In this way, transmission power control signals P1, P2, . . . , PN are determined.

The transceiver 11 for channel 1 transmits to a mobile terminal to which channel 1 is assigned signals of speech, data or the like to be transmitted at a transmission power level according to the transmission power control signal P1 for channel 1. The same procedure is taken for channels 2 through N, and signals to be transmitted are transmitted by electromagnetic wave from the base station's transmission/reception antenna 15 to the corresponding mobile terminals.

The waves emitted from the base station's transmission/reception antenna 15 are received by the respective mobile terminals. The operations of the mobile terminals will be described later.

In this manner, the transmission power on the transmitting side is prevented from rising excessively, and the range of interference is thereby compressed.